

INDUSTRIAL HYGIENE SAMPLING GUIDE  
FOR CONSOLIDATED INDUSTRIAL  
HYGIENE LABORATORIES  
(CIHLs)

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## OTHER-SAMPLE COLLECTION BOTTLES, VIALS, AND SUPPLIES

Supelco, Inc.  
Supelco Park  
Bellefonte, PA 16823-0048  
Phone: (800) 247-6628 FAX: (800) 447-3044  
Technical information only phone: (800) 359-3041  
<http://www.sigma-aldrich.com>

SKC, Inc. World Headquarters  
863 Valley View Road  
Eight Four, PA 15330-9614  
Phone: (800) 752-8472 FAX: (800) 752-8476  
<http://www.skcinco.com>

Pace Swipes (Used for swipes for metals) are available from:  
PALINTEST  
21 Kenton Lands Road  
P O Box 18733  
Erlanger KY 41018  
Phone: (800) 835-9629

## ABBREVIATIONS USED THROUGHOUT THE GUIDE

N	Norfolk Laboratory
P	Pearl Harbor Laboratory
S	San Diego Laboratory
@	at the concentration of
AMBERSORB	Special type of adsorption tube
Aq	aqueous
BSF	Benzene Soluble Fraction
CAS#	Chemical Abstract Service Registry Number
CIHL	Consolidated Industrial Hygiene Laboratory
CHROMOSORB	Special type of adsorption tube
CT	Charcoal tube (see special instructions for part number)
CV	Coefficient of Variation
FLORISIL	Special type of adsorption tube
FLT	Filter
GFF	Glass fiber filter
HOPCALITE	Special type of adsorption tube for Mercury vapor
ICP	Inductive Coupled Plasma (analyzes multiples of metals per sample)
INHOUSE	laboratory method developed within the organization

L	liters
LPM	liters per minute
LOD	limit of detection (an amount equal to three times the standard deviations of the analytical noise or three times that of a blank, whichever is more appropriate).
0.8 MCEF	Mixed cellulose ester filter, 0.8 micrometer pore size
mg/m <sup>3</sup>	milligrams per cubic meter
ml	milliliters
mm	millimeter
MW	Molecular Weight
NIOSH	National Institute for Occupational Safety and Health
ORBO	Adsorption tube trade marked by Supelco
OSHA	Occupational Safety and Health Administration
OVS-2	Special collection device for pesticides, available from Forest Biomedical.
ppm	parts per million
PTFE	Polytetrafluoroethylene filter
PVC	Polyvinyl chloride filter, 5 micrometer pore size
QCC	Quality Control Coordinator
SG	Silica gel sampling tube
ST	Sorbent tube
TENAX	Special type of adsorption tube
um	micrometer
XAD	Special type of adsorption tube

**INDUSTRIAL HYGIENE AIR SAMPLE SURVEY FORM NEHC 5100/13**  
**or Lab approved alternative form**  
**(Contact lab for copy of form)**

This form is used to record information collected while sampling with air sampling pumps and passive monitors. Analytical information is provided by the laboratory. As many as 5 stressors may be listed on each form, but only 1 worker. Personal breathing zone and area samples may be listed on the same form.

**Front Side**

**TO-** The address of the consolidated industrial hygiene laboratory to which the sample is being sent.

**FROM-** The complete address of the command requesting the sample analysis.

**POC-** The industrial hygienist to contact in case there are questions concerning the sample(s).

**PHONE-** The complete commercial and DSN phone numbers of the POC.

**FAX-** The fax number of the POC.

**DATE-** The date the samples were collected.

**IH UIC-** The Unit Identification Code (UIC) of the command providing industrial hygiene support.

**ACTIVITY-** The name of the command receiving industrial hygiene support.

**UIC-** The Unit Identification Code of the command receiving industrial hygiene support.

**BUILDING/LOCATION-** The building or hull number where the samples are being collected.

**SHOP/CODE-** The name and/or number of the shop where the employee being sampled works.

**EMPLOYEE SAMPLED NAME-** The complete name of the employee sampled.

**SSN/BADGE # -** The last 4 digits of the social security number or the badge number of the employee sampled.

**JOB TITLE -** Job title of individual sampled.

**(M)IL OR (C)IV-** Is individual sampled military or civilian?

**OPERATION-** A brief description of the operation performed during the sample period. (e.g., not 'painting' but 'spray painting ship's hull'.)

**CODE-** The operation code which most closely matches the operation being evaluated. A list of operation codes can be found in the Industrial Hygiene Field Operations Manual (IHFOM) at end of Chapter J.

**SHIFT-** Number codes - mark the appropriate box on the form.

- 1 = Day
- 2 = Evening
- 3 = Night

**FREQUENCY OF OPERATION-** Number codes - mark the appropriate box on the form.

- 1 = Daily
- 2 = 2-3 Times/Week
- 3 = Weekly
- 4 = 2-3 Times/ Month
- 5 = Monthly
- 6 = 2-3 Times/Year
- 7 = Yearly
- 8 = Special Occasions

**DURATION OF OPERATION-** Number codes - mark the appropriate box on the form. This is the usual or normal time it takes to perform the operation.

- 1 = 0 - 15 minutes
- 2 = 15 - 30 minutes
- 3 = 30 - 60 minutes
- 4 = 1 - 2 hours
- 5 = 2 - 4 hours
- 6 = 4 - 6 hours
- 7 = 6 - 8 hours
- 8 = >8 hours

**RESPIRATOR-** A description of the respirator being used by the employee, to include manufacturer, model, type of cartridge, etc. If no respirator is in use, state “none.”

**CODE-** The NIOSH approval number for the respirator used.

**PPE-** A description of any personal protective equipment in use during the sample period.

**CODE(S)-** The code(s) of the personal protective equipment in use. The list of codes to use can be found in the Industrial Hygiene Field Operations Manual (IH FOM) Appendix 3-C.

**PRODUCT USED-** A description of the product containing the stressor (e.g., welding rod, spray paint, degreaser, etc.).

**VENTILATION-** From the following list, select the most closely matching ventilation type:

- a. Natural
- b. General

- c. Small Booth
- d. Large Booth, non walk-in
- e. Large Booth, walk-in
- f. Canopy Hood
- g. Glove Box
- h. Laboratory Hood
- i. Free Hanging
- j. Lateral Slot
- k. Push-Pull
- l. Downdraft
- m. Metal working/wood working
- n. Low Volume-High Velocity

**MEETS SPECS-** Based on measurements, does the ventilation meet applicable standards or guide-lines? “Y” for yes; “N” for no; “U” for unknown.

**USED-** Is the ventilation system used? “Y” for yes; “N” for no.

**UNSAMPLED PERIOD-** Mark the appropriate box. For Other, please specify conditions.

**SAMPLE COLLECTION TYPE-** For each sample collected, mark the appropriate box on the form: P (personal) or A (area).

**TASK-** Further defines the operation.

**WORKSITE-** The location inside the building or ship where the sample is being collected.

**DURATION-** The duration of the sample, in minutes (calculated from pump 'on' and 'off' times).

**FLOW RATE-** The flow rate of the sampling pump, or the equivalent flow rate of the passive monitor, in liters per minute.

**VOLUME-** The total volume of air collected, in liters.

**SAMPLE #-** The unique number used to identify the sample.

**LABORATORY #-** The number used by the lab to identify and track the sample.

**STRESSOR/CAS #-** The stressor being sampled and the Chemical Abstracts Service (CAS) registry number.

**LOD-** The limit of detection of the analytical method, to be provided by the laboratory.

**RESULTS-** This data is provided by the laboratory. The analysis result(s) are expressed as ug per sample or fibers per mm<sup>2</sup>.

**CONCENTRATION-** Concentration of the stressor(s) in mg/m<sup>3</sup> or fibers/cc. To be calculated by the sample taker.

**8 HR TWA-** The calculated 8 hour time weighted average(s) of the stressor(s). To be calculated by the sample taker.

**DATE RECEIVED-** The date the sample was received by the laboratory.

**ANALYTICAL METHOD-** The method used by the laboratory to analyze the sample.

**ANALYSIS PERFORMED BY-** The name and signature of the chemist performing the analysis.

**DATE ANALYZED-** The date the sample was analyzed.

**ANALYSIS REVIEWED BY-** Name and signature of the reviewing supervisor.

**DATE REPORTED-** The date the laboratory reported the results.

**COMMENTS-** Explanatory comments by the chemist about the sample or analysis

#### **Reverse Side**

**CALIBRATOR-** The manufacturer, model, type and serial number of the calibration device.

**PRE CAL DATE-** The date the sample pump was pre calibrated. Must be the same date as post calibration and sample date unless sampling across the midnight hour.

**CALIBRATED BY-** The **printed** name and **signature** of the person performing the calibration.

**POST CAL DATE-** The date the sample pump was post calibrated. Must be the same as the precalibration date and sample date unless sampling across the midnight hour.

**PUMP MFG-** The manufacturer of the sampling pump or passive monitor.

**PUMP MODEL-** The model of the sampling pump or passive monitor.

**PUMP TYPE-** The type of pump or passive monitor

**PUMP SERIAL #-** The serial number of the pump or passive monitor.

**PRE CAL FLOW RATE-** The average flow rate during pump precalibration.

**POST CAL FLOW RATE-** The average flow rate during pump postcalibration.

**LOWER FLOW RATE-** The lower of the pre and post pump calibration flow rates. This flow rate is to be used when calculating sample volume. The difference between pre and post calibration values should not exceed 5% when calculated by the equation:

$$\% \text{ error} = (\text{high value} - \text{low value}) / (\text{low value}) \times 100$$

For passive monitors, enter the manufacturer's listed equivalent flow rate.

**FIELD SAMPLE ID-** The number used to identify the sample in the field.

**MEDIA-** The type of media used to collect the sample (e.g., MCEF, CT, 3M 3500 OVM).

**LOT/TUBE #-** The manufacturer's lot or tube number for the media.

**EXPIRATION DATE-** The expiration date of the media, if any.

**TIME OFF-** The time the sampling period ended.

**TIME ON-** The time the sampling period began.

**PUMP CHECK(S)-** The **time(s)** when the pump was checked to ensure proper operation.

**CALCULATIONS-** Any calculations associated with the calibration or sample results.

**TIME COURSE OF EVENTS/COMMENTS-** A detailed chronological description of the operation and any other comments or observations. Anyone reading this TCOE should be able to develop a mental image of what occurred during the operation.

**LENGTH OF OPERATION-** The actual amount of time the operation was performed on the day the sample was taken. This may or may not correspond to the actual sampling time.

**IHT/WPM-** The **printed** name and **signature** of the industrial hygiene technician or workplace monitor performing the sampling.

**DATE-** The date the form was signed.

**IH-** The **printed** name and **signature** of the industrial hygienist performing the sampling or reviewing the sample form.

**DATE-** The date the form was signed.

**PRIVACY ACT STATEMENT-** To be read, signed, and dated by the person being sampled, if required by your Command.

**INDUSTRIAL HYGIENE SINGLE STRESSOR AIR SAMPLE SURVEY FORM NEHC**  
**5100/14 or Lab approved alternative form**  
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**FAX-** The fax number of the POC.

**DATE-** The date the samples were collected.

**IH UIC-** The Unit Identification Code (UIC) of the command providing industrial hygiene support.

**ACTIVITY-** The name of the command receiving industrial hygiene support.

**UIC-** The Unit Identification Code of the command receiving industrial hygiene support.

**BUILDING/LOCATION-** The building or hull number where the samples are being collected.

**SHOP/CODE-** The name and/or number of the shop where the employee being sampled works.

**PRODUCT USED-** A description of the product containing the stressor (e.g., welding rod, spray paint, degreaser, etc.).

**VENTILATION-** From the following list, select the most closely matching ventilation type:

- a. Natural
- b. General
- c. Small Booth
- d. Large Booth, non walk- in
- e. Large Booth, walk- in
- f. Canopy Hood
- g. Glove Box

- h. Laboratory Hood
- i. Free Hanging
- j. Lateral Slot
- k. Push-Pull
- l. Down draft
- m. Metal working/wood working
- n. Low Volume- High Velocity

**MEETS SPECS-** Based on measurements, does the ventilation meet applicable standards or guidelines? “Y” for yes; “N” for no; “U” for unknown.

**USED-** Is the ventilation system used? “Y” for yes; “N” for no.

**UNSAMPLED PERIOD-** Mark the appropriate box. For Other, please specify conditions.

**SHIFT-** Number codes. Mark the appropriate box on the form.

- 1 = Day
- 2 = Evening
- 3 = Night

**FREQUENCY OF OPERATION-** Number codes. Mark the appropriate box on the form.

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- 3 = 30 - 60 minutes
- 4 = 1 - 2 hours
- 5 = 2 - 4 hours
- 6 = 4 - 6 hours
- 7 = 6 - 8 hours
- 8 = >8 hours

**M OR C-** Is/are the individual(s) being sampled military or civilian? Mark the appropriate Box (es). To be marked only if this is a personal sample.

**P OR A-** Is/are the sample(s) collected as personal (P) or area (A)? Mark the appropriate

Box (es). For area sample(s) the M or C box (es) should not be marked.

**EMPLOYEE NAME-** The complete name of the employee sampled.

**SSN/BADGE #-** The last 4 digits of the social security number or the badge number of the employee sampled.

**TASK-** Further defines the operation.

**WORKSITE-** The location inside the building or ship where the samples are being collected.

**JOB TITLE-** Job title of individual sampled.

**OPERATION-** A brief description of the operation performed during the sample period (e.g. not 'painting' but 'spray painting ship's hull').

**CODE-** The operation code which most closely matches the operation being evaluated. A list of operation codes can be found in the Industrial Hygiene Field Operations Manual (IHFOM) at end of Chapter J.

**RESPIRATOR-** A description of the respirator being used by the employee, to include manufacturer, model, type of cartridge, etc. If no respirator is in use, state “none.”

**CODE-** The NIOSH approval number for the respirator used.

**PPE-** A description of any personal protective equipment in use during the sample period.

**CODE(S)-** The code(s) of the personal protective equipment in use. A list of codes to be used can be found in the Industrial Hygiene Field Operations Manual, Appendix 3-C.

**STRESSOR-** The stressor being sampled. A list of stressors with exposure standards is in the IHIMS manual.

**CAS#-** The Chemical Abstracts Service (CAS) registry number.

**SAMPLE #-** The unique number used to identify the sample.

**LABORATORY#-** The number used by the lab to identify and track the sample.

**SAMPLE DURATION-** The duration of the sample, in minutes (calculated from pump 'on' and 'off' times).

**FLOW RATE-** The flow rate of the sampling pump, or the equivalent flow rate of the passive monitor, in liters per minute.

**VOLUME-** The total volume of air collected, in liters.

**RESULTS** This data is provided by the laboratory. The result(s) of analysis are expressed as mg per sample or fibers per mm<sup>2</sup>.

**CONCENTRATION-** The concentration of the stressor(s) in mg/m<sup>3</sup> or fibers/cc. **To be calculated by the sample taker.**

**8-HR TWA-** The calculated 8-hour time weighted average (s) of the stressor(s). **To be calculated by the sample taker.**

**DATE RECEIVED-** The date the sample was received by the laboratory.

**ANALYTICAL METHOD-** The method used by the laboratory to analyze the sample.

**LOD-** The limit of detection of the analytical method, to be provided by the laboratory.

**ANALYSIS PERFORMED BY-** The name and signature of the chemist performing the analysis.

**DATE ANALYZED-** The date the sample was analyzed.

**ANALYSIS REVIEWED BY-** Name and signature of the reviewing supervisor.

**DATE REPORTED-** The date the laboratory reported the results.

**COMMENTS-** Explanatory comments by the chemist about the sample or analysis.

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**CALIBRATOR-** The manufacturer, model, type and serial number of the calibration device.

**PRE CAL DATE-** The date the sample pumps were pre calibrated. Must be the same date as post calibration and sample date unless sampling across the midnight hour.

**CALIBRATED BY-** The **printed** name and **signature** of the person performing the calibration.

**POST CAL DATE-** The date the pumps were post calibrated. Must be the same as the pre calibration and sample date unless sampling across the midnight hour.

**PUMP MFG-** The manufacturer of the sampling pump or passive monitor.

**PUMP MODEL-** The model number of the sampling pump or passive monitor.

**PUMP TYPE-** The type of air sampling pump (i.e., multi-flow, high flow, etc.).

**PUMP SERIAL #-** The serial number of the sampling pump or passive monitor.

**PRE CAL FLOW RATE-** The average flow rate during pre calibration.

**POST CAL FLOW RATE-** The average flow rate during post calibration.

**LOWER FLOW RATE-** The lower of the pre and post calibration flow rates. This flow rate is to be used when calculating sample volume. The difference between pre and post calibration values should not exceed 5% when calculated by the equation:

$$\% \text{ error} = (\text{high value} - \text{low value}) / (\text{low value}) \times 100$$

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